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L. V. Kurnosova, ed.

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or No 3.

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RUSSIAN, per, Iskusstvennyye Sputniki Zemli,
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Liberations of a Satellite, by V. V. Beletskiy,
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No 3, Moscow, 1959, pp 13-31.

NASA TT F-10

Sci - Space Res

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NASA TT F-45

National Aeronautics and Space Administration.

FIRST-ORDER PERTURBATIONS IN THE MOTION
OF EARTH SATELLITES DUE TO OBLATENESS OF
THE EARTH. V. F. Proskurin and Yu. V. Batrakov.
November 1960. 12p. OTS price, \$0.50.
(NASA TECHNICAL TRANSLATION F-45. Translation
from Iskusstvennyy Sputnik Zemli, no. 3, 1959,
p. 32-38 (USSR))

An analytical theory is presented for artificial earth satellites, on the assumption that the oblateness of the planet is small enough so that the perturbation function in powers of the oblateness can be limited to the term containing only the first powers of the oblateness of the earth. This portion of the perturbation function is expanded in powers of the eccentricity. Integration of the ordinary Lagrange equations yields analytical expressions of the first-order perturbations relative to the oblateness of all of the elements of the orbit, accurate to the fourth degree of the eccentricity inclusive.

Copies obtainable from NASA, Washington

- I. Proskurin, V. F.
- II. Batrakov, Yu. V.
- III. NASA TT F-45
- IV. Iskusstvennyy Sputnik Zemli, no. 3, 1959,
p. 32-38 (USSR)

(Initial NASA distribution:
6, Astronomy; 7, Astrophysics; 16, Cosmochemistry;
17, Communications and sensing equipment,
flight; 21, Geophysics and geodesy; 30, Physics,
atomic and molecular; 31, Physics, nuclear and
particle; 33, Physics, theoretical; 46, Space mechanics;
47, Satellites.)

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SLA NASA 61-15118

NASA TT F-46

National Aeronautics and Space Administration.
PERTURBATIONS OF ORBITS OF ARTIFICIAL
SATELLITES DUE TO AIR RESISTANCE. Yu. V.
Batrakov and V. F. Proskurin. November 1960.

13p. OTS price, \$0.50.

(NASA TECHNICAL TRANSLATION F-46. Translation from Iskusstvennyy Sputnik Zemli, no. 3, 1959, p. 39-47 (USSR))

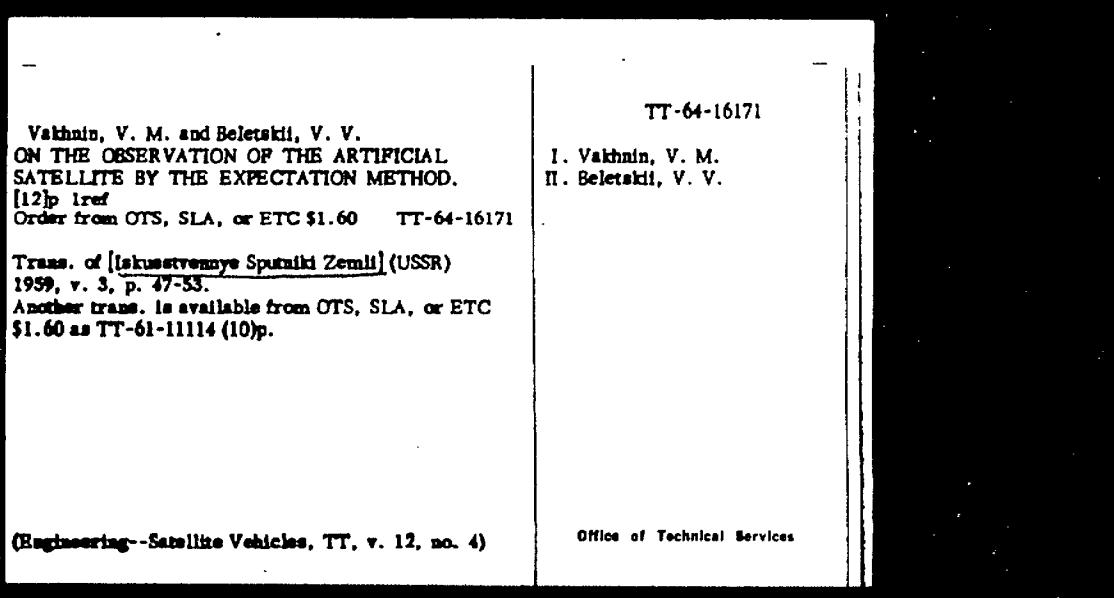
OT TT-63-24298 (16μ)
Presentation of a general form of the first-order perturbations in the elements of an elliptic satellite orbit, caused by the resistance of the air, is undertaken. It was assumed that the earth's atmosphere has a fully spherical density distribution and that the attraction of the earth can be replaced by the attraction of the material point, placed at its center of inertia and having the same mass as the earth. These assumptions, along with the secular perturbations, are used to obtain faster perturbations whose periods do not exceed the period of one rotation of the satellite.

Copies obtainable from NASA, Washington

- I. Batrakov, Yu. V.
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(Initial NASA distribution:
6, Astronomy; 7, Astrophysics; 16, Cosmochimistry; 17, Communications and sensing equipment, flight; 21, Geophysics and geodesy; 30, Physics, atomic and molecular; 31, Physics, nuclear and particle; 33, Physics, theoretical; 46, Space mechanics; 47, Satellites.)

133, 876
NASA



NASA TT F-48

National Aeronautics and Space Administration.
OBSERVATION OF AN ARTIFICIAL SATELLITE BY
THE EXPECTATION METHOD. V. M. Vakhnin and
V. V. Beletskiy. November 1960. 10p. OTS
price, \$0.50.
(NASA TECHNICAL TRANSLATION F-48. Translation
from Iskusstvennyy Sputnik Zemli, no. 3, 1959,
p. 47-53 (USSR))

An expectation method is presented for predicting the appearance of an artificial satellite within the observation range of the spotting equipment. For successful application of the method, it is important to take into account only one variable factor, namely, the rate of orbit precession.

Copies obtainable from NASA, Washington

- I. Vakhnin, V. M.
- II. Beletskiy, V. V.
- III. NASA TT F-48
- IV. Iskusstvennyy Sputnik Zemli, no. 3, 1959, p. 47-53 (USSR)

(Initial NASA distribution:
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102-137
NASA

NASA TT F-47

National Aeronautics and Space Administration.
DEPENDENCE OF SECULAR VARIATIONS OF ORBIT
ELEMENTS ON THE AIR RESISTANCE. P. E.
El'yasberg. November 1960. 10p. OTS price,
\$0.50. (NASA TECHNICAL TRANSLATION F-47.
Translation from *Iskusstvennyy Sputnik Zemli*, no. 3,
1959, p. 54-60 (USSR))

107-63-04295 (121x)
Presented is an extension of the idea, proposed by
I. M. Yatsunskiy, of expanding the secular variations
of the orbit elements in Bessel functions of imaginary
argument. This results in simple and illustrative
formulas which can be used to solve many problems,
such as determination of the dependence of the secular
variations of the orbit elements on the values of the
elements themselves, estimation of the accuracy of
determination of the air density from the measured
secular variations of the orbit elements, and so forth.

Copies obtainable from NASA, Washington

- I. El'yasberg, P. E.
II. NASA TT F-47
III. *Iskusstvennyy Sputnik Zemli*, no. 3, 1959,
p. 54-60 (USSR)

(Initial NASA distribution:
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17, Communications and sensing equipment,
flight; 21, Geophysics and geodesy; 30, Physics,
atomic and molecular; 31, Physics, nuclear and
particle; 33, Physics, theoretical; 46, Space mechanics;
47, Satellites.)

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NASA

Puncture Problem at Cosmic Velocities, by
M. A. Lavrent'ev, 2 pp.

RUSSIAN, ^{bk}~~per~~, Iskusstvennye Sputniki Zemli,
No 3, 1959, pp 61-65.

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NASA

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Shklovskii, L. S. and Kurt, V. G.

DETERMINATION OF ATMOSPHERIC DENSITY AT
A HEIGHT OF 430 KM BY THE SODIUM VAPOUR
DIFFUSION METHOD (Oprdelenie Plotnosti Atmosfery
na Vysoke 430 KM Metodom Diffuzii Parov Natriya) tr.
by J. W. Palmer. May 60 [14p] 16refs RAE Library
Trans. no. 896.

Order from OTS, SLA, or ETC \$1.60 TT-63-24297

Trans. of Iakusstvennye Sputniki Zemli (USSR) 1959,
v. 3, p. 66-76.

Another trans. is available from OTS or SLA \$1.60 as
TT-60-21413, NASA TT-E-15, Apr 60, 13p.

DESCRIPTORS: *Upper atmosphere, Density,
Barometric pressure, Meteorological parameters,
Sodium, Vapors, Diffusion, High altitude, Rockets.

For abstract see Technical Translations 4: 214, 1960
(Earth Sciences--Atmosphere, TT, v. 11, no. 3)

TT-63-24297

I. Shklovskii, L S.
II. Kurt, V. G.
III. RAE Trans-896
IV. Royal Aircraft
Establishment (Gt. Brit.)

Office of Technical Services

Some Results of the Determination of the
Structural Parameters of the Atmosphere
Using the Third Soviet Artificial Earth
Satellite, by V. V. Mikhnevich, B. S. Denilin,
A. I. Repnev, V. A. Sokolov, 7 pp.

RUSSIAN, per, Искусственные Спутники Земли,
No 3, 1959, pp 84-97.

NASA TT -13

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NASA TT F-53

National Aeronautics and Space Administration.
RADIO-FREQUENCY MASS SPECTROMETER FOR
THE INVESTIGATION OF THE IONIC COMPOSITION
OF THE UPPER ATMOSPHERE. V. G. Istomin.

January 1961. 21p. OTS price, \$0.75.

(NASA TECHNICAL TRANSLATION F-53. Translation from Iskusstvennyy Sputnik Zemli, no. 3, 1959, p. 98-112 (USSR))

Described is the device by which data were obtained on the mass spectrum of positive ions of the ionosphere at altitudes up to 885 km using Soviet high-altitude rockets and the third Soviet artificial satellite. Single-row type grids used in the ion-source unit and in the analyzer, as well as other unique features, are described in detail.

FDD X-4926

Copies obtainable from NASA, Washington

- I. Istomin, V. G.
- II. NASA TT F-53
- III. Iskusstvennyy Sputnik Zemli, no. 3, 1959, p. 98-112 (USSR)

(Initial NASA distribution:
17, Communications and sensing equipment, flight;
19, Electronics; 21, Geophysics and geodesy;
30, Physics, atomic and molecular.)

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NASA

Manometer Error Caused by Slight Blows in the
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y.

RUSSIAN, bk, Izhusstvennye Sputniki Zemli,
No 3, 1959, pp 113-117.

NASA TT 14
CTS 60-21442

Sci - Spac Res

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The Determination of the Density of the Atmosphere
at an Altitude of 430 Kilometers by the Sodium Vapor
Diffusion Method, by I. S. Shklovskiy, V. G. Kurt.

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No 3, 1959, pp 66-76.

NASA TT 15

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Methods of Combating Interfering Currents That
Arise at the Input of an Electrostatic Fluxmeter
Operating in a Conducting Medium, by I. M.
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1959, pp 77-83.

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NASA 115,534
TT 16

On the Problem of the Interaction Between a
Satellite and the Earth's Magnetic Field, by
Yu. V. Zonov, 11 pp.

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NASA TT P-37

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<p>Kislik, M. D. THE MOTION OF THE ARTIFICIAL SATELLITE IN A NORMAL GRAVITY FIELD OF THE EARTH. [1962] [20]p. 6 refs. Order from OTS or SLA \$1.60 63-10312</p> <p>Trans. of <u>Iskusstvennye Sputniki Zemli</u> (USSR) 1960, v. 4, p. 3-17. Another trans. is available free from Land-Air as LTS-6. When supply is exhausted, order from OTS or SLA \$3.60 as 61-27018, 1 May 61 [32]p.</p> <p>DESCRIPTORS: *Satellite vehicles, *Orbital flight paths, Gravity, Earth, Motion.</p> <p>For abstract see Technical Translations 6: 349, 1961.</p> <p>(Engineering--Satellite Vehicles, TT, v. 10, no. 3)</p>	<p>63-10312</p> <p>I. Kislik, M. D.</p> <p>Office of Technical Services</p>
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<p>El'yasberg, P. E. and Yastrebov, V. D. DETERMINATION OF UPPER-ATMOSPHERE DENSITY FROM THE RESULTS OF THE OBSERVATIONS OF SPUTNIK 3 (Opredelenie Plotnosti Verkhnei Atmosfery po Rezul'tatam Nablyudenii za Poletom Tret'ego Sovets- kogo Iskusstvennogo Sputnika Zemli) tr. by J. W. Palmer. Feb 61 [19p] Refs RAE Library Trans. no. 937; AD-258 609. Order from OTS, SLA or ETC \$1.60 TT-63-24322</p> <p>Trans. of Iskusstvennye Sputniki Zemli (USSR) 1960, v. 4, p. 18-30. Another trans. is available from OTS or SLA \$2.60 as TT-61-27991, ARGMA Trans-16-61, 21 Jul 61 [23]p. (Abstract available)</p> <p>DESCRIPTORS: *Upper atmosphere, Density, Deter- mination, *Atmospheric sounding, *Satellites (Artificial), Orbital trajectories, Numerical analysis, (Earth Sciences--Atmosphere, TT, v. 11, no. 2) (over)</p>	<p>TT-63-24322</p> <p>I. Title: Sputnik-3 I. El'vasberg, P. E. II. Yastrebov, V. D. III. RAE Trans-937 IV. AD-258 609 V. Royal Aircraft Establish- ment (Gt. Brit.)</p> <p>Office of Technical Services</p>
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Kolegov, G. A.

VARIATIONS IN THE DENSITY OF THE UPPER ATMOSPHERE FROM DATA ON THE CHANGE OF PERIODS OF REVOLUTION OF ARTIFICIAL EARTH SATELLITES (Varyatsii Plotnosti Verkhnei Atmosfery po Dannym ob Izmenenii Periodov Obrashcheniya Iskusstvennykh Sputnikov Zemli) tr. by J. W. Palmer. Feb 61 [7p] 5refs RAE Library Trans. no. 931; AD-253 448.

Order from OTS, SLA or ETC \$1.10 TT-63-24320

Trans. of Iskusstvennye Sputniki Zemli (USSR) 1960, v. 4, p. 31-34.

Another trans. is available in ARS Journal, v. 32, no. 3, \$3.00 and an abstract trans. from LC or SLA m1\$2.70, ph\$4.80 in 61-15182, AD 60-96, 30 Nov 60 [21p]. (Abstract available)

DESCRIPTORS: *Upper atmosphere, Density, *Atmospheric sounding, *Satellites (Artificial), Orbital (Earth Sciences--Atmosphere, TT, v. 11, no. 2) (over)

TT-63-24320

- I. Kolegov, G. A.
- II. RAE Trans-931
- III. AD-253 448
- IV. Royal Aircraft Establishment (Gt. Brit.)

Office of Technical Services

<p>Eneev, T. M., Platonov, A. K., and Kazakova, R. K. THE DETERMINATION OF PARAMETERS FOR THE ORBIT OF AN ARTIFICIAL SATELLITE ACCORDING TO DATA OF GROUND MEASURINGS. Apr 62 [20]p. 4 refs. Order from OTS or SLA \$1.60 63-10168</p> <p>Trans. of <u>Iskusstvennye Sputniki Zemli</u> (USSR) 1960, v. 4, p. 43-55. Another trans. is available free from Land-Air as LTS-4. When supply is exhausted order from OTS or SLA \$2.60 as 61-19531, 15 Mar 61 [25]p.</p> <p>DESCRIPTORS: *Satellite vehicle trajectories, Earth, *Orbital flight paths, Geophysics, Numerical analysis, Determination.</p> <p>For abstract see Technical Translations <u>6</u>: 180, 1961.</p> <p>(Engineering--Satellite Vehicles, TT, v. 9, no. 11)</p>	<p>63-10168</p> <p>I. Eneev, T. M. II. Platonov, A. K. III. Kazakova, R. K.</p> <p>Office of Technical Services</p>
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<p>Taratynova, G. P. METHODS FOR THE NUMERICAL SOLUTION OF EQUATIONS IN FINITE DIFFERENCES AND THEIR APPLICATION TO THE CALCULATIONS OF THE ORBITS OF ARTIFICIAL EARTH SATELLITES. Apr 62 [38]p. 9 refs. Order from OTS or SLA \$3.60</p> <p>63-10332</p> <p>Trans. of <u>Iskusstvennye Sputniki Zemli</u> (USSR) 1960, v. 4, p. 56-81. Another trans. is available free from Land-Air as LTS-3. When supply is exhausted, order from LC or SLA mi\$3.30, ph\$7.80 as 61-19039, 15 Jan 61 [47]p.</p> <p>DESCRIPTORS: Satellite vehicle trajectories, Equations, *Orbital flight paths, Numerical analysis, *Numerical methods and procedures.</p> <p>For abstract see Technical Translations 5: 498, 1961. (Engineering--Satellite Vehicles, TT, v. 9, no. 11)</p>	<p>63-10332</p> <p>I. Taratynova, G. P.</p> <p>Office of Technical Services</p>
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of the Upper Atmosphere, by B. A. Mirtov, 24 pp.

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by Yu. G. Shafer, A. V. Yarygin, 15 pp.

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Some Results of Measurement of Mass Spectra of
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Magnetometers in the Third Soviet Earth Satellite,
by S. Sh. Dolginov, L. N. Zhurgov, V. A. Selyutin,
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Elements of the Theory of the Impact of Solid
Bodies with High (Cosmic) Velocities, by
K. P. Stanyukovich, 42 pp.

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Determination of the Parameters of the Orbit
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Determination of Illumination Conditions and Periods
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Satellite, by I. M. Yatsunskii, 11 pp.

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